

SCIENTIFIC NOTE

The Helicopsychidae, a caddisfly family new to British Columbia (Insecta: Trichoptera)**ROBERT A. CANNINGS^{1,2} and GINA ROBERTS³**

The Helicopsychidae is a small but distinctive family of the Trichoptera containing 10 genera (Morse 2007). It is found in most faunal regions around the world (Wiggins 1996a). The cosmopolitan genus *Helicopsyche* consists of about 238 described species (Morse 2007) and is the sole North American genus in the family. Although this genus is mostly tropical in distribution, it contains five known species north of Mexico (Morse 2007).

Helicopsyche borealis (Hagen) is the only species ranging north into Canada. Despite its name, it is not a typical trans-continental boreal species but is only distributed northerly relative to other species in the genus. It is widespread and common over much of North America (Wiggins 1996a) but has not been recorded from the Yukon (Wiggins and Parker 1999) or previously in British Columbia (BC) (Nimmo and Scudder 1978, 1983). It prefers clear, fast-flowing streams, but also inhabits the littoral zone of lakes (Wiggins 1996a, Schmid 1998) and is among the caddisflies most tolerant of high water temperatures (Wiggins 1996a), perhaps a reflection of the tropical origin of the genus (Williams *et al.* 1983).

The most striking feature of almost all species in the family is the larval case, which, finely built of sand grains and silk, strongly resembles a tightly coiled snail shell. Indeed, *H. borealis* was originally described as a gastropod (Lea 1834). This distinctive, compact and consolidated case probably is an adaptation for a larval life in beds of gravel and stones (Williams *et al.*

1983, Wiggins 1996a). The larvae feed on diatoms and plant detritus on the surfaces of the rocks or in the spaces between them (Williams *et al.* 1983).

This note records the first specimens of *H. borealis* and the family Helicopsychidae from BC. The main material examined was collected by Gina Roberts from the San Jose River, 2.4 km east of its mouth in Williams Lake (52°05'50"N x 121°59'52"W) on 9 November 1998. The water at the collection site was up to 50 cm deep and flowed at about 0.3 to 0.5 m/sec. During spring run-off, the river's water level rises 1 to 1.5 m. Larvae were abundant; over the 3 or 4 m of river examined, there were several hundred larvae per square decimetre. The specimens, about 100 in total, are housed in three ethanol lots in the Royal British Columbia Museum (ENT001-000978, 79, 80).

In addition, two small collections of specimens from the Chilcotin River were deposited as vouchers at the Royal BC Museum as part of Environment Canada's Fraser River Action Plan. Although the larval specimens were labeled and identified to family in the project, the Helicopsychidae was not listed in the benthic invertebrate report describing the collections and their analysis (Rosenberg *et al.* 1999). The data for the two sites on the Chilcotin River are: 52°12'41"N x 123°50'50"W, 21.x. 1994, 3040' asl, T.B. Reynoldson; and 52°18'52"N x 123°58'35"W, 22.x. 1994, 3180' asl, T.B. Reynoldson. These sites are northwest of Redstone between Puntzi Creek and Chilcotin Lake.

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Wiggins (1996a) illustrated the larva and case. The mean maximum diameter of 30 cases from the San Jose River sample was 2.7 mm (range 2.2-3.3 mm). According to Ross (1944) and Wiggins (1996a) the diameter of the case of a full-grown larva ranges from about 5 to 7 mm, suggesting that these specimens were about half grown. Williams *et al.* (1983) summarized what little is known about the species' life history. They indicated that an Ontario population they studied was probably univoltine, with the adults emerging in the last half of June.

No adult *Helicopsyche* specimens were collected at the San Jose or the Chilcotin River sites. Adults of *H. borealis* should be looked for in BC. They are about 5-7 mm long and typically are pale yellow washed

with various shades of brown. They lack ocelli, the mesotibiae do not have preapical spurs and the costa of the hindwing is broadly angled and bears a row of hooks on the basal half (Schmid 1998). The vertex has large setal warts extending from the mesal margins of the eyes to the mid-dorsal line and anteriorly to the middle of the head (Wiggins 1996b).

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REFERENCES

- Lea, I. 1834. Observations on the Naiades and descriptions of new species of that and other families. Transactions of the American Philosophical Society n.s. 4: 63-121.
- Morse, J.C. (Ed.). 2007. Trichoptera World Checklist. <http://entweb.clemson.edu/database/trichopt/index.htm#na>. Accessed 16 July 2007.
- Nimmo, A.P. and G.G.E. Scudder. 1978. An annotated checklist of the Trichoptera (Insecta) of British Columbia. *Syesis* 11: 117-133.
- Nimmo, A.P. and G.G.E. Scudder. 1983. Supplement to an annotated checklist of the Trichoptera (Insecta) of British Columbia. *Syesis* 16: 71-83.
- Rosenberg, D.M., T.B. Reynoldson and V.H. Resh. 1999. Establishing reference conditions for benthic invertebrate monitoring in the Fraser River catchment, British Columbia, Canada. Fraser River Action Plan report DOE-FRAP 1998-32. Environment Canada, Vancouver, BC, Canada.
- Ross, H.H. 1944. The caddis flies, or Trichoptera, of Illinois. Illinois Natural History Survey Bulletin 23: 1-326.
- Schmid, F. 1998. The Insects and Arachnids of Canada. Part 7. Genera of the Trichoptera of Canada and adjoining or adjacent United States. NRC Research Press, Ottawa, Ontario, Canada.
- Wiggins, G.B. 1996a. Larvae of the North American caddisfly genera (Trichoptera), 2nd edition. University of Toronto Press, Toronto, Ontario, Canada.
- Wiggins, G.B. 1996b. Trichoptera, pp. 309-386. In R.W. Merritt and K.W. Cummins (Eds.), An introduction to the aquatic insects of North America. Kendall/Hunt, Dubuque, Iowa.
- Wiggins, G.B. and C.R. Parker. 1999. Caddisflies (Trichoptera) of the Yukon, with analysis of the Beringian and Holarctic species of North America, pp 787-866. In H.V. Danks and J.A. Downes (Eds.), Insects of the Yukon. Biological Survey of Canada (Terrestrial Arthropods), Ottawa, Ontario, Canada.
- Williams, D.D., A.T. Read and K.A. Moore. 1983. The biology and zoogeography of *Helicopsyche borealis* (Trichoptera: Helicopsychidae): a Nearctic representative of a tropical genus. Canadian Journal of Zoology 61: 2288-2299.